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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,624	06/15/2001	Ian Wylie	WYLIE 5	8470

27964 7590 12/09/2002

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EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 12/09/2002

12

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/882,624

Applicant(s)

WYLIE, IAN

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 July 2002 has been entered.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-32 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Each of the independent claims requires an interface separating the first and second portions of the source/drain regions. The specification does not appear to provide enabling support for the claimed interface separating the first and second portions of the source/drain regions. (See instant specification paragraphs [0024] and [0042] through [0044] Should an interface exist, electrical contact might not be made between the portions.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 7-10, 12-14, 16, 17-19, and 21-25 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,043,778 (**Teng** et al.).

**Teng** discloses a semiconductor device comprising,

a semiconductor substrate **10** having N- and P-wells **14**, **16** (Fig. 7);

a gates **24** above each well in the semiconductor substrate;

a channel region **33** (Fig. 5A; col. 9, line 4);

a trench (**32** and that portion holding the part of the isolation region **20**) adjacent the channel region **33** (Fig. 3; col. 8, lines 53-58);

an isolation region **20** formed adjacent the semiconductor substrate and located within the trench and comprising an oxide (col. 7, line 21), wherein the isolation region includes a first portion and a second post portion (shown as the narrower portion at the top of **20**, but not labeled), wherein the second portion is located over the first portion, and wherein the trench does not extend under the channel region **33**, and wherein the isolation is between the transistors indicated by the gates **24**; and

a first portion of a source/drain region **44** formed in the semiconductor substrate, and a second portion of the source/drain region **36** formed on the isolation region from polysilicon (col. 8, lines 57-58) and in contact with the second post portion but not in the semiconductor

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substrate, and wherein there exists an “interface” between the first and second portions of the source/drain region.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6, 11, 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Teng** in view of US Patent Application 2002/0142552 A1 (**Wu**).

The prior art of **Teng**, as explained above, discloses each of the claimed features except for forming the isolation region to extend through a transistor tub (“well”).

**Wu** teaches each of the features of the independent claims except for the second portion contacting the post portion **114a** of the isolation. Note that the isolation region extends through the tubs/wells.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use form the isolation of **Teng** to extend through a tub/well, as taught by **Wu** in order to form a more thorough isolation between devices as shown in **Wu**.

8. Claims 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Teng** in view of Applicant’s admitted prior art (**APA**).

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**Teng**, as explained above, discloses all of the features of the instant invention except for specifically showing the interconnect and other active and passive devices.

Applicant indicates that Fig. 12 shows a conventional integrated circuit (paragraph [0022]) with interconnect **1220** and other active and passive devices and that one of ordinary skill is familiar with these additional elements (paragraph [0044]).

It would have been obvious to one of ordinary skill at the time of the invention to modify **Teng** to include known interconnect and active and passive device in order to form a functioning circuit, such as a DRAM, because it highly desired in the art to form whole integrated circuits rather than just parts which would, in isolation, be useless.

9. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Teng** in view of **APA**, as applied to claim 27 above, and further in view of US Patent Application 2002/0142552 A1 (**Wu**).

The prior art of **Teng**, as explained above, discloses each of the claimed features except for forming the isolation region to extend through a transistor tub ("well").

**Wu** teaches the features as noted above.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use form the isolation of **Teng** to extend through a tub/well, as taught by **Wu** in order to form a more thorough isolation between devices as shown in **Wu**.

### ***Response to Arguments***

10. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4,683,637 (**Varker** et al.) and US 4,487,639 (**Lam** et al.) each anticipate at least each of the independent claims. See the figures in each.

US 6,399,973 B1 (**Roberds**) teaches each of the features of the independent claims except for the second post portion of the isolation region. (See the figures.)

US 6,465,852 B1 (**Ju**) teaches each of the features of the independent claims except for the first portion of the source/drain region being formed in the semiconductor substrate. (See the figures.)

JP 11-274483 A (**Tsuchiaki**) discloses the semiconductor substrate 11, gates 16a, 19a, source/drain portions 23a, 26a over the *oxide isolation regions 12 formed in a trench, which extend through tub ("n-well")* 14 and source/drain portions 22, 25 formed in the semiconductor substrate, located in a trench, and interconnect 17, 18, 24, 25. The channel is formed in the substrate, not over the isolation region. Plural transistors are disclosed which are separated by the isolation regions 12. Interconnect 18, 29 is shown in Fig. 5(i) on the last page. (See also Abstract and all figures -- especially the cover figures.)

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Erik Kielin  
December 5, 2002